Society Reports.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, held at the New York Academy of Medicine, Tuesday evening, February 6th, 1894.

Dr. M. ALLEN STARR, President, in the chair.

Dr. LESZYNSKY exhibited a portable, air-tight alcohol lamp, made of metal, which he stated he has found very serviceable in applying cupping glasses. It also serves all the purposes of a spirit lamp. The ordinary methods of applying the cupping glasses are very annoying and sometimes painful to the patient. In the cups with the rubber bulbs the rubber is apt to get hard and crack.

ELECTRICAL REACTIONS AND THEIR VALUE IN DIAGNOSIS AND PROGNOSIS.

DISCUSSION.

The PRESIDENT said that he has seen statements from various sources, some very dogmatic and others sceptical, in regard to the value of electrical tests as an aid to diagnosis and prognosis in various forms of nervous disease. A careful review of the literature of nervous diseases will reveal to anyone that most men who have written books on this subject have gone back to the original article of Erb, published in 1872, in the first edition of Ziemssen's Cyclopedia, and have copied Erb's diagrams and statements. Individuals who have had many opportunities of making electrical tests have noticed from time to time that their results did not correspond with the statements laid down by Erb. Their results, however, were not made public, or else they tried to explain them away, as if something was wrong with them. A discussion on this subject, therefore, is very timely.

Dr. C. L. DANA opened the discussion and took up the subject of the value of electrical reactions in spinal lesions. In connection with this subject he had particularly studied the records of a certain number of cases in which he was able to test the reactions many times in the course of the disease. The tests were made in cases of anterior polio-myelitis, progressive muscular atrophy and bulbar palsy; also, in cases of facial palsy and locomotor ataxia.

It is absolutely necessary, Dr. Dana said, in making any comparative statements about our results, that we should understand how the reactions were taken by each observer, and what he means by reaction of degeneration. The reactions are subject to such variability, and it is so easy to deceive one's self, that the operation requires an extremely judicial state of mind and great care. In the tests made by himself he has employed an indifferent electrode, about the size described by Erb: this is to be tied down, not held by the hand, so that there are no variations in the amount of pressure. For the active electrode he employed a small, pointed electrode, the surface of which measures one square centimetre. By means of this one can get the muscular irritability at different parts of the muscle, one can see whether the contractions are sluggish or otherwise, and one also observes the diffusibility of the contraction, which is a form of reaction which has not been sufficiently noted. If an electrode with a large surface is employed, the "diffusible reaction" is not brought out with any certainty. The small pointed electrode can also be shifted to the motor point of the nerve, and thus the nerve reaction be obtained. In some cases, the strength of the current required is so great that the point electrode gives rise to too much pain; in such a case he employs the ordinary sized electrode. The electrode is first placed on the body of the muscle and reaction obtained with a gradually increasing current and then the same reaction with a gradually decreasing current; these reactions are compared with those on the opposite side and the operation repeated two or three times with a proper interval between to allow the muscle rest.

The three points that he has particularly investigated in connection with spinal lesions are, first, the relative irritability of the two poles; second, the character of the reactions, that is, whether they were sharp or sluggish, or sluggish and diffuse; and third, the course of the variations of the reactions in the different stages of the disease.

With regard to the relative irritability of the positive and negative poles, many of the recorded cases merely show that the cathode exceeded the anode in irritability, without giving the exact number of milliamperes required to produce contractions. Dr. Dana said that he considered this an inaccurate method of making the measurements. In all records it should be carefully put down how many milliamperes are necessary to produce a positive pole contraction and then the negative pole contraction, or *vice versa*. In this way, by following the course of the disease, one will find that each pole has a definite course of increased and decreased irritability in accordance with the progress of the disease. The speaker exhibited a number of diagrams which he has prepared, showing the course of the polar irritability in several cases of progressive muscular atrophy, in two cases of anterior polio-myelitis, and in one case of double facial palsy; in the latter case he was able to make daily examinations of both sides of the face for a number of weeks. His observations go to show that there is a difference between the course of the polar irritability in neuritis and that in progressive muscular atrophy and polio-myelitis. In neuritis, there is a pronounced steady rise in the polar irritability, while in the spinal lesions it is very slight or absent. So far as his observations go, there is a true degenerative reaction in progressive muscular atrophy, as there is in polio-myelitis, but we only get it in certain stages of the disease. In all the descriptions of electrical degenerative reactions, the fact is spoken of that in normal muscles and in partly degenerated muscles the reactions are sharp and quick, but that when the muscles become degenerated the reactions are sluggish or vermicular. Further than this, with the point electrode, there is a diffuse contraction of the muscle; that is, the whole belly of the muscle, and even the adjacent muscles, will contract. This "diffusibility" of the contraction, Dr. Dana said, he considered equally important with the sluggishness, although it does not always take place. It was better seen with the anodal contraction. In conclusion, Dr. Dana thought that we had to revise many of our views regarding degenerative reaction, but it was too soon to formulate new views.

DR. W. M. LESZYNSKY continued the discussion, confining his remarks more particularly to the value of electrical reactions in cases of traumatic neuritis. His method of making the examination, he stated, was very similar to that outlined by Dr. Dana. The conclusions drawn by him were as follows:

1. That the value of electricity as an accessory method in diagnosis and prognosis of the disease of the peripheral nerves is not as universally recognized as its importance demands.

2. That the result of this procedure often furnishes corroborative and conclusive evidence, where only a provisional diagnosis has been made.

3. That the necessary technical skill in successfully pursuing such investigations and correctly interpreting the result, can only be acquired through special study and practice.

4. That the use of the faradic current alone is quite sufficient for diagnostic purposes.

5. That, as a rule, the galvanic current is supplemental to the faradic, and, in the absence of faradic irritability in nerve and muscle, it is of the greatest service in prognosis.

6. That the discovery of the reaction of degeneration is not an essential feature in the differential diagnosis as to the location of the lesion.

7. That the peripheral nerve fibres possess an inherent power of regeneration which seems almost unlimited, the length of time required for the completion of the regenerative process varying from a few weeks to seven years or more. Therefore, in severe forms of injury, the cause, degree and character of damage to the nerve are often of greater importance in prognosis than the demonstration of the reaction of degeneration.

8. That the presence of reaction of degeneration, or partial reaction of degeneration, is not incompatible with the preservation of motility in the same area. This paradoxical condition has been found in cases of lead poisoning and a few others, but thus far the cause has been inexplicable.

9. That strong cureents are only rarely necessary. The weakest current that will produce a distinctly perceptible reaction is all that is requisite.

10. That a decrease or disappearance of faradic irritability in nerve and muscle simply denotes an interference with the nutrition in the course of the motor tract between the multipolar cells in the anterior horn and the peripheral nerve distribution. It does not enable us to judge of the nature of the pathological process.

11. That the character of the reactions does not differ, whether the lesion be situated in the cells of the anterior

horn, the anterior nerve roots, the nerve trunks, or in their ultimate distribution. The same rule holds good in reference to the various cranial motor nerves and their nuclei, such as the facial, hypoglossal and spinal accessory nerves.

12. When the farado-muscular irritability is lost, no reaction can be obtained by a rapidly interrupted galvanic current.

13. The secondary current from an induction coil is the one generally used in testing faradic irritability. Owing to its high electromotive force, the resistance encountered in the moistened skin may be disregarded.

14. The difference in the poles of the faradic current is only a relative one, and cannot be determined by the usual tests as applied to the galvanic current. The electromotive force in the secondary coil is greater at the "break" than at the "make." The electrode that is felt to be the stronger in its action is usually considered as the negative or so-called "faradic cathode."

15. In some apparently healthy individuals the musculo-spiral nerve fails to react to strong currents applied with the "faradic anode," while a comparatively weak current from the "faradic cathode" calls forth a quick response.

16. In a case of undoubted peripheral paralysis the faradic irritability may be preserved, but it almost invariably requires a stronger current to produce muscular contractions than upon the healthy side; (quantitative decrease). Dr. Leszynsky said he has never seen a case where this could not be demonstrated within a few days after the onset of the paralysis.

17. The character of the muscular reaction demands attention. A slow and labored contraction associated with decrease in faradic irritability denotes degenerative changes.

18. The faradic irritability may return in persistent cases of peripheral paralysis without any perceptible improvement in motility.

19. Electro-diagnosis is inapplicable in paralysis of ocular muscles.

20. When the farado-muscular irritability is lost upon skin excitation, its presence may be demonstrated in the muscle for a longer time by means of acupuncture.

21. If electricity is to be of any service to us in ascertaining whether the nerve-trunk has been divided or not, as a result of traumatism, the examination must be

made as soon after the injury as possible. We can then determine at once if special surgical interference is necessary. Should two or three weeks elapse before such examination, it will be impossible to state whether the absence of reaction is due to traumatic neuritis or to complete division of the nerve. Exploratory incision would then be called for.

22. The tests with the galvanic current require adequate apparatus and a working knowledge of the relationship between electromotive force, resistance and current strength. It also requires much time, patience and perseverance. Hence, its unpopularity.

DR. M. A. STARR spoke of the value of electrical reaction in cases of multiple neuritis. He reviewed the conclusions of Nothnagel, Pal, Gowers and others, which were to the effect that great variations in electrical reaction have been observed, and gave the histories of a number of cases of multiple neuritis coming under his observation. The first case reported was one of general alcoholic multiple neuritis, with total paralysis in both arms and both legs. In this case, within two months after the onset, when the paralysis was extreme and when no voluntary movement was possible in the muscles of the arm, forearm or hand, the electrical reactions differed completely in these localities. In the arm there was a diminution of response to both currents without polar changes; in the forearm there was loss of faradic response and diminution of galvanic response without polar changes; in the hand there was loss of faradic response, diminution of galvanic response with polar changes.

In two other cases of alcoholic multiple neuritis, very great variations were present in muscles which were equally paralyzed. In a case of diphtheritic paralysis there was a total loss of contractility to faradism, but no polar changes to the galvanic current. In another case of diphtheritic multiple neuritis in which ataxia rather than paralysis was a marked symptom, an interesting fact was noted. There appeared to be a slight weakness in the right supinator longus muscle. The electrical reactions of this muscle, however, were found to be normal, the reaction to faradism being prompt, and the cathode closure contraction being greater than the anode closure contraction. For purposes of comparison the left supinator longus was simultaneously tested, there being no voluntary paralysis of this muscle whatever. It was found that the reaction to galvanism in this muscle showed polar changes, the anode closure contraction being greater than the cathode closure contraction, although there was no reduction in the faradic response. Here, then, was an observation which confirms the statement of Pal that electrical changes are sometimes present in muscles which are not paralyzed.

In closing his remarks, Dr. Starr said that every possible change to electrical reactions may be present in muscles affected in the course of multiple neuritis. The conclusion is inevitable, therefore, that to the electrical changes no very great diagnostic significance can be assigned. In the cases cited there was no parallelism between voluntary power and electrical condition. Voluntary power in all the cases seemed to return before the electrical reactions became normal. Therefore, we cannot project a reaction line upon a chart into the future and say that at a certain date when the electrical reactions become normal the voluntary power must necessarily return. Electrical reactions, therefore, while of some interest, are not to be taken as of great importance in the diagnosis of multiple neuritis.

Dr. B. SACHS discussed the value of electrical reactions in dystrophies. In regard to the general subject of reaction degeneration, the speaker said he has been forced to the conclusion that there are only two points of value. The first and most significant feature of reaction degeneration is the loss of faradic response. The second is the sluggishness of the contraction. The variability between the anodal and cathodal contraction is extremely great, and he has long since abandoned the idea that the relationship between the two can be utilized in all cases, either for the purpose of diagnosis or prognosis. Physiologists have demonstrated with considerable plausibility that the electrical excitation of nerves and muscles depends largely upon the rapidity and succession of single shocks. In muscles in which the faradic contractility seems to be absent, if you diminish the interruptions, you will often get a contraction, whereas you will not get it with the ordinary faradic machines we use. Dr. Sachs said he believed we can state that reaction degeneration is present in any given case if the faradic response is absent. He agreed with Dr. Dana's remarks regarding the variations in polar irritability in different stages of anterior polio-myelitis, and other diseases. In Erb's diagrams, which have been so extensively copied, he does not differentiate between anodal and cathodal response. He does not make any distinction between the two poles. Dr. Sachs said he has found the greatest possible variability in the action of the two poles. In many cases, particularly in peripheral nerve palsies, he has found that the cathodal excitability is increased as long as the disease lasts. After full power has returned, the faradic excitability may still be diminished or loss for a period of time varying between several weeks and a year. In exceptional cases the faradic response remains normal from beginning to end, but the galvanic changes are pronounced.

The speaker said it is well to divide muscular dystrophies into two classes, namely, primary muscular dystrophies and the so-called amyotrophies. In the pure dystrophies we rarely get a definite reaction degeneration. That is, there is rarely entire absence of faradic response and marked sluggish reaction, excepting in the very last stages of the disease when so little muscular fibre is left that we cannot expect to get either faradic or galvanic response. In primary muscular dystrophy, therefore, there is no typical reaction of degeneration. In progressive muscular atrophy of spinal origin reaction of degeneration may be present in its entirety, but we find the partial reaction of degeneration and other irregular types of electrical reaction. As regards the value of electrical reaction in diagnosis and prognosis, Dr. Sachs said he is fully in accord with the statements made by the previous speakers, but he still believes that Erb's observations were extremely well founded, and hold good in the majority of cases. It is certainly true that if the faradic response—in a case of facial paralysis, for instance—is never lost, in nine cases out of ten recovery will be more prompt than where it is lost. That the faradic irritability returns in some cases before the power, as claimed by Dr. Leszynsky, he thought exceptional, to say the least. It is much more certain that the power returns long before the faradic does in the vast majority of cases.

As regards the value of electricity as a means of prognosis in cases of muscular dystrophy, the speaker thought it was very slight. The senses of sight and touch will teach us much more than the electrical examination in such cases. By the degree of response to the faradic and galvanic currents we can get some idea as to the condition of each individual muscle, but no definite conclusions can be drawn. In some cases of typical muscular dystrophy, certain muscles unquestionably do recover; others do not. In the cases which recover, the electrical reactions do not undergo any decided changes.

DR. A. D. ROCKWELL said he agreed with Dr. Sachs that the main importance of electricity as an aid to diagnosis, was in connection with the absence or presence of the faradic reaction. The importance of this subject to the general practitioner was impressed on his mind by a case that recently came under his observation. The case was one of facial paralysis, and the patient for seven weeks had been under the care of a general practitioner, who treated him with the faradic current without any benefit. Under the use of galvanism, the patient at once began to improve. The following case indicates very positively the value of electricity as a diagnostic agent: The case was one of typical facial palsy on the right side from peripheral causes. During the course of the patient's recovery from this, a paralysis occurred on the left side of the face; this started as a peripheral paralysis, but on testing the muscles with faradism, it was found that they responded with perfect facility. Therefore, it was evident that the paralysis on this side was central. Shortly afterwards the patient had a second attack involving the right side of the face, again peripheral. Dr. Rockwell said that in ovarian or uterine diseases, if congestion or inflammation exists, the faradic current produces no improvement, but rather aggravates the pain; in conditions where inflammation and congestion are absent, the application of the faradic current will relieve the pain. He considered this point of impor tance also from a diagnostic standpoint.

DR. GEORGE W. JACOBY said that the statements made in the text-books on this subject are too dogmatic. The diagnostic value of electricity is limited to certain peripheral affections, and even there it is not as great as originally claimed. In prognosis also we must limit its value. In a number of cases of facial paralysis of long-standing, he has found it impossible to obtain any reaction of degeneration. In a couple of other cases in which the paralysis had entirely disappeared with the exception of a slight obliteration of the labio-nasal fold, there was marked reaction of degeneration. These are exceptional cases, and he could give no explanation of them. Cases have been published in which there was a reaction of degeneration found in cerebral palsies; also in cases of primary dystrophy.

DR. C. A. HERTER referred to the electrical reactions in some cases of cerebral palsies. In one case coming under his observation, a woman aged seventy years, the patient had a series of slight apoplectic attacks, succeeded in time by complete paralysis of the right side of the body—face, arm and leg—and complete motor aphasia; at the end of one week, distinct atrophy of the muscles of the forearm was noticeable, and at the end of one month it was very pronounced. The faradic irritability of certain muscles of the forearm was very much reduced. The contractions were exceedingly sluggish, and the reaction of degeneration was undoubtedly present. The galvanic irritability of these muscles was somewhat diminished. Dr. Herter also referred to the rapidity with which the reaction degeneration makes its appearance in some cases of injury of the spinal cord. In two instances coming under his observation it was pronounced at the end of four days.

Dr. L. STIEGLITZ agreed with Dr. Sachs that the most important feature of the reaction of degeneration is the sluggishness of the contraction. It must be borne in mind that muscles of coarse fibre react much more sluggishly than those made up of fine fibres.

Dr. G. M. HAMMOND said he agreed, in general, with the statements made by the previous speakers. Like Dr. Sachs, he has noticed that muscles that do not respond to a rapidly interrupted faradic current will respond to a slowly interrupted one. The reverse is true with the galvanic current. With a battery that he employs he can get about 170,000 interruptions per minute, and he has found that the greater the number of interruptions, the stronger the current required. This rule applies in both healthy and diseased conditions.

Dr. STARR narrated the history of a case of facial paralysis that came under his care. An examination showed increased contractility to galvanism in the muscles, and perfect preservation to faradism, the cathode being greater than the anode. On the strength of this he gave a favorable prognosis. After six weeks careful treatment the reactions remained about the same, but the paralysis was no better. The patient then went to another neurologist, who made a similarly favorable prognosis; he continued the use of electricity with equally unfavorable results. That is now a year and a one-half ago. The reactions are still normal, but the face remains just as much paralyzed as it ever was.

(This discussion is continued in the meeting of March 6. See below.)

Dr. DANA exhibited a portable perimeter which he has devised.

Stated Meeting, held at the New York Academy of Medicine Tuesday evening, March 6, 1894.

Dr. M. ALLEN STARR, President, in the chair.

A CASE OF EXOPHTHALMIC GOITRE; THYROIDECTOMY.

Presented by Dr. J. ARTHUR BOOTH. The patient was a female, aged twenty-four, single. Family and personal histories negative. About two years ago the woman first noticed an enlargement of the throat, and three months later the eyes became affected. The patient is positive that there were no heart symptoms until six months ago, when palpitation, throbbing in the vessels of the neck, shortness of breath and flushing of the face appeared. All these symptoms gradually increased in intensity, and the patient became irritable, easily excited, anxious and unable to sleep because of the tumultuous action of the heart. When the woman first came under observation both the eyes were very prominent, especially the left, and the lids did not follow the movements of the eye-balls (Graefe's symptom). The pupils were moderately dilated, reacting to light and accommodation. Fundus normal. Vision not impaired. The enlargement of the thyroid body was marked, the right lobe being the larger. Pulse 150, of high tension. Apex beat of the heart diffused; no murmur. Respirations, 24. No tremor of hands or fingers. Examination of urine negative. The patient was given daily applications of galvanism and received one two-hundredth of a grain of aconitia twice daily and fifteen grains of iodide of potash three times daily. She was also instructed to practice full inspiration frequently and to rest as much as possible during the day. Under this treatment there was decided improvement in the symptoms, but only temporary in character, and on November 8, 1893, thyroidectomy was performed by Dr. B. F. Curtis at St. Luke's Hospital, the right lobe of the thyroid being removed. The patient made an uneventful recovery, and during the four months that have elapsed since the operation there has been a steady improvement in all her symptoms. The pulse-rate now ranges between 96 and 110. Many of her nervous symptoms have entirely disappeared. She sleeps well, does not suffer from palpitation and is able to attend to her house-work. The eyeballs are much less prominent. The left side of the thyroid has diminished in size to a slight extent since the operation.

A CASE OF EXOPHTHALMIC GOITRE; THYROIDECTOMY.

Presented by Dr. ROBERT SAFFORD NEWTON. The patient was a girl, aged twelve. In this case almost complete extirpation of the thyroid was performed, only a small supernumerary lobe being left. Since the operation, the exopthalmos, which was very pronounced, has almost entirely disappeared. Before the operation the pulse-rate was 180, and the child suffered from cyanosis. The systolic and diastolic heart-sounds were almost synchronous. The operation was performed by Dr. Fowler on October 21, 1893, and the child was out of bed three days afterwards. Her pulse now averages about 100. She is able to attend school, and is much improved in every way.

The PRESIDENT stated that the absolute contrast between the symptoms in exopthalmic goitre and myxœdema makes it seem very probable that many of the symptoms of the former disease are due to an excessive secretion of the thyroid gland, just as those in myxœdema are due to its suppression. Up to the present time, there are not enough cases on record to permit us to make definite statements regarding it.

A CASE OF PROGRESSIVE MUSCULAR ATROPHY OF THE PERONEAL TYPE.

Presented by Dr. GEORGE W. JACOBY. The case was that of an illegitimate child, a girl, aged twelve years. The mother states that the child's father was a large, well-proportioned man, but that he was rejected for military service abroad because his muscles were weak. This is the only hereditary factor obtainable. The history of the case, in brief, is as follows: There was no trouble at the child's birth. When two years of age, some months after an attack of measles, she complained of pain in the lower extremities, which was so severe that she could not stand. This lasted about six weeks, and from that time on she appeared to have difficulty in walking. She has always been able to move her legs in every direction. When she was four years old, it was noticed that one leg was weaker and thinner than the other. About one year ago, it was first noticed that there was an atrophy of the thigh on the side opposite to that of the affected leg. She holds the legs in a stiff and clumsy position. There is a lack of symmetry between the two buttocks. She has marked lordosis and slight lateral curvature. The muscles of both thighs are in a continual state of unrest, almost like fibrillary twitchings The right foot is in equino-varus position. There are no sensory disturbances. There is partial reaction of degeneration in the affected muscles. The arms are not affected. The superficial reflexes are normal. The tendon reflexes are present, but somewhat reduced on the affected side. In conclusion, Dr. Jacoby said that while he regarded the case as one of progressive muscular atrophy of the peroneal type, it was not absolutely a typical one, inasmuch as the atrophy, although, bi-lateral, is a symmetrical, one leg being affected and the opposite thigh.

Dr. B. SACHS said he agreed with Dr. Jacoby's diagnosis of the case. The atypical distribution of the atrophy should not militate against the diagnosis, as that is really the last thing to be considered, although still so much insisted on by many writers. The distribution of the atrophy is largely a matter of chance. He had seen six cases of progressive muscular atrophy of the peroneal type—which is, perhaps, the rarest form of the disease. In none of these was there a crossed distribution of the atrophy, as in Dr. Jacoby's case.

A CASE OF HYSTERIA, WITH PECULIAR EPILEPTOID ATTACKS.

Presented by Dr. BOOTH. The patient was a male; aged 22; jeweller; a native of Germany. During the past two months he has had attacks when he suddenly begins to sing, to slap his knees with his hands (either one or both) and to stamp his feet. The attack lasts only a few seconds and ends with a screech. The attacks come on without apparent cause, and occur frequently during the day and occasionally at night. Patient does not lose consciousness. When he was eight years old he had similar attacks, extending over a period of nine months: again, three years ago, he had them for a period of about one year. At that time he went under treatment at Strasburg, Germany, but did not receive any benefit. The attacks ceased by themselves. Patient does not smoke; drinks moderately; practiced masturbation to a moderate extent when he was younger, and continued it for three years. Family history negative. Never had a fall or blow. Denies venereal disease.

A CASE OF NEURALGIA OF THE GREAT OCCIPITAL NERVE, ASSOCIATED WITH SYMPTOMS OF A DESTRUCTIVE LESION OF THE CERVICAL SYMPATHETIC.

By Dr. ALEXANDER B. JOHNSON. The patient was a man aged 60; married; a railroad conductor by occupation; denies venereal disease; no alcoholic habit. Had malaria thirty years ago. No distinct history of rheumatism. No signs of organic disease. Over the chest and back he has several old, white, depressed scars, which he states are the result of abscesses he had many years ago, and that they were a long time in healing. The patient presented himself on November 1, 1893, complaining of a severe pain in the right side of the head, which made it impossible for him to work. This trouble began three years ago. The pain is of an aching character, and occurs in paroxysms. It is referred to a point about two inches behind the lobule of the right ear, and radiates upward and backward to the vertex. There is marked tenderness on pressure over this area. The patient further complained of inability to see well with the right eye, and the upper eye-lid on that side drooped so far as nearly to cover the pupil when the patient looks straight before him; the lower eye-lid is slightly elevated. The right pupil is contracted, smaller than the left, and does not react to light. The eye is watery and the right side of the face is redder than the left. There is no paralysis of the face, but the skin and muscles appear less full and feel flabby in comparison with the left side. The patient was examined by Dr. M. Allen Starr, who located the lesion in the cervical sympathetic, and advised an exploratory operation, as the patient had undergone medical treatment of various kinds without relief.

On November 4, 1893, an incision three and one-half inches in length was made along the posterior border of the right sterno-mastoid, beginning just below the mastoid process. The sterno-mastoid muscle and internal jugular vein were drawn forward by means of a blunt hook, and the internal carotid artery was lifted up. The superior cervical ganglion was found to be included within the sheath of the internal carotid, to which it appeared to be distinctly adherent. The adhesions were divided and the ganglion was freed, as well as the cord below to the extent of two inches. No abnormality in appearance could be recognized either in the ganglion or cord, and the wound was closed. The neuralgic pains and the tenderness of the scalp disappeared at once after the operation. The lacrymation and flushing of the face ceased. The pupil on the right side reacted slightly to light and became a little larger, and his right upper eye-lid drooped so little that it was scarcely noticeable and did not at all interfere with vision. At the end of six weeks, however, all the symptoms had returned, and at the present time the patient finds himself in no way improved.

In closing his paper, Dr. Johnson said that while the symptoms in this case were fairly typical of paralysis or a destructive lesion of the cervical sympathetic, it is possible that they were due to a lesion situated in the spinal cord of a destructive character, the exact location of which it is at present impossible to determine. He was unable to explain the immediate temporary benefit of the operation in this case, excepting that it was the result of a powerful peripheral impressson.

Dr. WILLIAM M. LESZYNSKY referred to a case which he presented some years ago in which there was hemorrhage into the cervical portion of the cord, with decided symptoms of involvement of the cervical sympathetic on the same side.

The PRESIDENT said that Krouse (Zeitschrift für Klinische Medicin, 1891) reports nine cases of crushing accidents to the spinal cord, involving the lower cervical and upper dorsal segments in which there were marked symptoms referable to the cervical sympathetic. Regarding the case narrated by Dr. Johnson. Dr. Starr said his own impression was rather against the idea of a cord lesion, on account of the absence of other cord symptoms, although there was not a valid reason for excluding it entirely.

ELECTRICAL REACTIONS AND THEIR VALUE IN DIAGNOSIS AND PROGNOSIS.

DISCUSSION (Continued).

The PRESIDENT stated that the subject of electrical reactions, and their value in diagnosis and prognosis, which had been taken up at the last meeting, was such an important one, that it had been decided to continue it at this time.

Dr. FREDERICK PETERSON said that in the main, he agreed with the previous speakers regarding the reaction of degeneration, and with the conclusions recently published by Remak, in particular. We have found that both nerves and muscles may respond to both the faradic and galvanic currents, and yet degeneration may exist. With the galvanic current, polar changes are inconstant; CCC may be greater than AnCC. In normal muscles we occasionally find, on the other hand, that AnCC may be greater than CCC. There is one sign that may be considered as always present where there is degeneration in the spino-muscular portion of the motor tract, and that is, the sluggish, vermicular contraction of the muscle. Furthermore, in the great majority of cases of degenerative lesions in the anterior horns or peripheral nerves, the faradic reactions are diminished or lost. Dr. Peterson felt that sufficient stress had not been laid upon the actual value of electro-diagnosis in distinguishing cerebral palsies from the degenerative cases. He was convinced that most neurologists found it of the same value as heretofore, though we had modified our opinions as to the manifestations.

One of the speakers at the last meeting called attention to the occasional occurrence of atrophy with degenerative reactions in cerebral palsies, as cited in two cases by Eisenlohr some years ago. It was interesting to know that Eisenlohr had recently made autopsies in both of these cases, and had found degeneration in the peripheral nerves. Other observers have found atrophic changes in the ganglion-cells of the anterior horns in cases of hemiplegia with muscular atrophy. There is no evidence in those rare instances in which muscular atrophy accompanies cerebral palsy, that the trophic change is produced by an affection of trophic centres in the brain. On the contrary, all the evidence at hand shows that the atrophy depends upon degenerative lesions in the spino-muscular portion of the motor tract. The value of the electrical examination remains therefore, as before.

The electric reactions are certainly of great value in the distinction of the primary muscular dystrophies from progressive spinal atrophies.

Dr. J. F. TERRIBERRY continued the discussion. He confined his remarks to the value of electrical reactions, as regards diagnosis and prognosis, in paralysis of the facial nerve, and gave the following conclusions, which he had deducted from an analysis of twenty-four such cases coming under his observation:

1. That we have in electricity an agent of the highest value as an aid to diagnosis in paretic troubles of the seventh nerve.
2. That the value of electricity as an aid to prognosis in facial paralysis is comparatively slight. Less than one-half the cases reported could be prognosticated, and even those with considerable hesitation.
3. That those cases in which the degree of paralysis is slight are the ones of which we can speak with most confidence by the aid of electricity.
4. That it is impossible to foretell the issue of severe cases by means of the electrical examination.
5. That the teachings of Erb respecting the diagnosis and prognosis of lesions of the motor peripheral nerves by means of electricity are the best at our command, although very imperfect.

Dr. WILLIAM J. MORTON sent a communication on the subject of electrical reactions, which was read by the Secretary. He stated that in case of degeneration of the nerve, the faradic and galvanic excitability is diminished or lost, while in case of degeneration of the muscle the faradic excitability is lost, but there is an exaggeration of the galvanic excitability and an inversion of its normal polar action. This abnormal reaction of an abnormal muscle was indeed a most brilliant discovery by Erb, but it has always seemed to him that an over-refinement of diagnostic and prognostic significance has been attached to it. As regards diagnosis, the electric reaction is often the only means of deciding that a given nerve or muscle is in process of degeneration. In traumatic neuritis, in multiple neuritis, and in sciatic, facial and many other neurites, in the dystrophies and the spinal lesions due to affection of the nerve cells of the anterior cornu, it is certainly a great satisfaction to feel sure that the degenerative process exists, and this satisfaction is easily acquired by aid of electrical reactions. He did not, however, consider the reactions of much value in making a differential diagnosis between one and another of the above affections, or between a multiple and migrating neuritis, or between sub-acute or chronic anterior poliomyelitis and a progressive muscular atrophy, or, lastly, between a cerebral and spinal lesion. As regards the prognostic value of electrical reactions, Dr. Morton believed that over-confidence is placed in the deductions to be drawn from "the complete" and the "incomplete reaction of degeneration." In its complete form, as we sometimes see it in grave facial paralysis and in infantile spinal paralysis, our prognosis is unmistakably bad and fairly exact. It is in the incomplete reaction of degeneration that we are often proven to be mistaken if we indulge in a too exact prognosis. In cases where the electrical reactions of both nerve and muscle have been completely lost, he has known the muscle to regain some part of its former volume, and the normal electrical reactions to return by means of long-continued local treatment by aid of sparks from an influence machine. He considers that the earliest sign of the reaction of degeneration is the failure of a muscle to respond to a spark which will set a corresponding normal muscle into contraction.

Dr. LESZYNSKY said that in making the differential diagnosis between peripheral and cerebral lesions in cases of facial paralysis, the quantitative changes should be taken into consideration; in the peripheral cases there is a quantitative diminution, while in the cerebral cases there is a quantitative increase. In paretic condition, he still relies on electricity, both as regards diagnosis and prognosis. There are cases in which we make mistakes, but in the vast majority of instances the laws laid down by Erb are correct.

Dr. B. SACHS said that if the discussion of this question at the last meeting had a nihilistic tendency, it was due to the fact that it was treated from the neurologist's point of view, and the speakers were attempting to make out in what way the current would be of value in refinements of diagnosis. He expressed the opinion that all of us still recognize the vast importance of electricity in the differential diagnosis between cerebral and peripheral cases, or cerebral and spinal cases, and also its great value in functional cases.

Dr. E. D. FISHER said that, in the main, he agreed with the statements made by the previous speakers. In certain diseases, such as the dystrophies, chronic anterior poliomyelitis and progressive muscular atrophy the electrical reactions are of great value. It is true that in the dystrophies we do not get an absolute loss of the faradic response until very late in the disease; with marked atrophy we may still get a response to the faradic current wherever the fibres remain. As regards the differential diagnosis between cases of progressive muscular atrophy and chronic poliomyelitis, in the former we do not, as a rule, get a complete reaction of degeneration—we may get a partial one—while in the latter we are very apt to get complete reaction of degeneration. In differentiating between cerebral and spinal cases, electricity is of value, although not always essential.